Guildline

# AC Voltage Reference

# 7410

## Features

- Precision AC Reference
- 16 different frequencies
- 16 selectable waveforms
- External sensing
- Voltage Range 1mV to 7.07V
- 100mA Output Current
- Thermal Convertor Calibration
- Automatic Calibration
- Ease of use

The Guildline 7410 AC Voltage Reference is a digitally synthesized AC voltage source. It provides 16 Multiple waveform shapes at 16 different frequencies, and at 5 different voltage levels.

Precision waveforms stored in non-volatile memory are generated using new technology developed at The National Institute of Standards and Technology (NIST). The model 7410 utilizes two Digital to Analogue Converters (DACs) to generate an extremely stable AC Analogue waveform at frequencies of up to 156.25 kHz. Up to 512 DC steps are used to generate the output waveform.

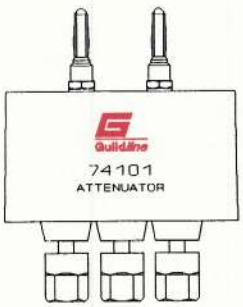
In operation, data stored in the non-volatile memory for a given waveform is sent alternatively to each of the two DACs. One DAC is set using bytes on all even addresses, while the other is set using all odd addresses. The output of each DAC is time-multiplexed to the output amplifier, so that the output of the first DAC is being used to drive the output, while the output of the second amplifier is being changed to its pre-programmed next step. By multiplexing the two DACs in this manner, step noise is reduced, resulting in the highest accuracy/stability RMS voltage commercially available.

Versatility designed into this innovative AC Voltage Reference enables the use of an external 10V DC Solid State Reference (such as a Guildline 4410 Voltage Standard) as the DC reference for the DACs, instead of the 7410's own internal 10V DC Reference.

An optional Attenuator, 74101, has been designed for those applications and requirements, where a lower output is needed. The ranges provided are 1mV, 10mV, 100mV and 1V. This expands the range of use for the 7410 AC Voltage Reference significantly.

Calibration of the 7410 AC Voltage Reference is easily accomplished utilizing a precision DC Voltmeter and a computer. The standard equipment software supplied enables fast and efficient calibration of the instrument.

After calibration, the typical total stability of the 7.07 RMS output is less than 15 ppm over the frequency range 0.1 Hz to 15 kHz.




*The 7410 is based on the original work performed at the National Institute of Standards and Technology, (NIST).*

***For Services and/or Calibration Contact:***

**Guildline Calibration Services**

***A Primary Standards Laboratory***

## SPECIFICATIONS:

**Output Uncertainty (24 hrs) @ 23°C±5°C,** Nominal Output 7.07V RMS

| Number of Steps in Waveform | (± ppm of output) Frequency Range (Hz) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0.1 | 1 | 10 | 100 | 1k | 10k | 20k | 40k | 80k | 156k |
| 512 | 10 | 10 | 10 | 10 | 10 | 20 | 200 | | | |
| 256 | 10 | 10 | 10 | 10 | 10 | 20 | 50 | 200 | | |
| 128 | 10 | 10 | 10 | 10 | 10 | 15 | 20 | 50 | 200 | |
| 64 | 10 | 10 | 10 | 10 | 10 | 20 | 50 | 200 | 2000 | 1% |

Absolute uncertainty, traceability to National Standards, is dependant on the absolute uncertainty of the DC Reference and the digital voltmeter used to step calibrate the 7410.

**Frequency Range:** 0.0093Hz to 156.25kHz

**Switch Frequencies:** 1.16mHz; 1.2, 2.3, 4.8, 9.5, 19.1, 39.1, 76.3, 156.6, 305.2, 610.3Hz; 1.22, 2.44, 4.88, 9.76, 19.53kHz.
(512 step waveform)

**Waveforms:** Sine - 512, 256, 128, 64 steps
Ramp - 512 steps
Chopped Sine - 45° & 90° firing angle
Sine with Pulse - crest factor 8, 5, & 3
Sine with 40% 2nd Harmonic - 0° & 90°
Sine with 40% 3rd Harmonic - 0°, 90°, 180°, & 270°

**Attenuator,** (optional): 1V, 100mV, 10mV and 1mV

*Note: Slight degradation in performance may occur when using the attenuator.*

## GENERAL SPECIFICATIONS

**Dimensions:** H 185mm (7.3in), W 225mm (8.9in), D 500mm (19.7in)

**Weight:** 5.8kg (12.7lb)

**Power Supply:** Voltage - 100,120, 220, 240 ±10%
Frequency - 50/60Hz
Consumption - 20VA

**Environment:** Operating 18°C to 28°C <50% RH
Non Operating -20°C to 60°C, 15 to 80% RH

## HOW TO ORDER:

**7410** AC Voltage Reference, complete with MS-DOS®* formatted software on 3½ & 5¼ Diskette

**Accessories:**

**74101** Attenuator

**TM7410** Technical Manual (included)

**MS-DOS® is a Trade Mark of Microsoft Corporation*

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**Guildline** *"Blending Craft and Technology"™*

**CANADA & OVERSEAS:**
**Guildline Instruments Ltd.**
P.O. Box 99 • 21 Gilroy St. • Smiths Falls, Ontario K7A 4S9 • Canada
(613) 283-3000 Telex 053-3266 Fax: (613) 283-6082

**UNITED STATES:**
**Guildline Instruments Inc.**
103 Commerce St. • Suite 160 • Lake Mary, FL 32746
(407) 333-3327 Fax: (407) 333-3309